What Is Claimed Is:

1. A method of accurately processing a discrete time input signal, $p(n)$, having a first clock rate into a discrete time output signal having a second clock rate, comprising the steps of:

delta filtering the input signal to produce an intermediate signal having the first clock rate; and

delta interpolating the intermediate signal to produce the output signal, whereby computational errors are minimized.

2. The method of claim 1, wherein said delta filtering step comprises:

calculating an input delta signal, $d(n)$, according to $d(n) = p(n) - p_i$, wherein p_i is an initial value of $p(n)$;

generating a filtered delta signal $f(n)$ from $d(n)$; and

adding p_i to $f(n)$, thereby generating the intermediate signal.

3. The method of claim 2, wherein said generating step comprises the step of generating a finite impulse response (FIR) filtered delta signal $f(n)$ from $d(n)$.

4. The method of claim 1, wherein said delta interpolating step comprises the steps of:

upsampling the intermediate signal to the second clock rate;

calculating an upsampled intermediate delta signal, $u(n)$, according to $u(n) = i(n) - p_i$, wherein $i(n)$ is the upsampled intermediate signal and p_i is an initial value of $p(n)$;

generating a filtered intermediate delta signal $g(n)$ from $u(n)$; and

adding p_i to $g(n)$, thereby generating the output signal.

5. The method of claim 4, wherein said generating step comprises the step of generating a finite impulse response (FIR) filtered intermediate delta signal $g(n)$ from $u(n)$.

6. The method of claim 5, wherein said generating step comprises the step of generating a Lagrange finite impulse response (FIR) filtered intermediate delta signal $g(n)$ from $u(n)$.

7. The method of claim 1, wherein the second clock rate is an integer multiple of the first clock rate.

8. The method of claim 1, wherein the input signal is a position signal.

9. The method of claim 1, wherein the output signal is sent to a control system that controls a photolithography scanning operation.

10. A system for accurately processing a discrete time input signal, $p(n)$, having a first clock rate into a discrete time output signal having a second clock rate, comprising:

means for delta filtering the input signal to produce an intermediate signal having the first clock rate; and

means for delta interpolating the intermediate signal to produce the output signal,

whereby computational errors are minimized.

11. The system of claim 10, wherein said delta filtering means comprises:

means for calculating an input delta signal, $d(n)$, according to $d(n) = p(n) - p_i$, wherein p_i is an initial value of $p(n)$;

means for generating a filtered delta signal $f(n)$ from $d(n)$; and

means for adding p_i to $f(n)$, thereby generating the intermediate signal.

12. The system of claim 11, wherein said generating means comprises means for generating a finite impulse response (FIR) filtered delta signal $f(n)$ from $d(n)$.

13. The system of claim 10, wherein said delta interpolating means comprises:

means for upsampling the intermediate signal to the second clock rate;

means for calculating an upsampled intermediate delta signal, $u(n)$, according to $u(n) = i(n) - p_i$, wherein $i(n)$ is the upsampled intermediate signal and p_i is an initial value of $p(n)$;

means for generating a filtered intermediate delta signal $g(n)$ from $u(n)$; and

means for adding p_i to $g(n)$, thereby generating the output signal.

14. The system of claim 13, wherein said generating means comprises means for generating a finite impulse response (FIR) filtered intermediate delta signal $g(n)$ from $u(n)$.

15. The system of claim 14, wherein said generating means comprises means for generating a Lagrange finite impulse response (FIR) filtered intermediate delta signal $g(n)$ from $u(n)$.

16. The system of claim 10, wherein the second clock rate is an integer multiple of the first clock rate.

17. The system of claim 10, wherein the input signal is a position signal.

18. The system of claim 10, wherein the output signal is sent to a control system that controls a photolithography scanning operation.